

SYSTEM AND METHOD FOR PRODUCING A SELECTABLE VIEW OF AN OBJECT SPACE

BACKGROUND OF THE INVENTION

[0001] Currently, when people watch a show on television for which there is a very large object space, such as a sports game (football, baseball, basketball, etc.), a concert, a talk show, or the like, the available view is limited by the view or views chosen by the videographers of the show. For example, in a televised baseball game, the total area of possibly interesting views is very large. This area includes not only the entire baseball diamond and outfield, but may also include the stands or bleachers in which screaming fans attempt to catch a foul ball or homerun hit. Unfortunately, when the videographer zooms out to show the entire interesting object space, the resolution becomes very poor, and the features and activities of individual people or players becomes very difficult, if not impossible, to distinguish. The videographer solves this problem by zooming in on the most interesting person or player, such as the player at bat, with the consequence that the television viewing public cannot view anything else. Not only does a person watching television have no option about which section of the object space to view, and with what resolution (i.e., how much zoomed in or out), but additionally the view on television is not very natural. In other words, a fan in the bleachers may naturally choose his own view by moving his head in different directions. In contrast, the view available to the television watching person is not affected by her bodily motions, or the turning of her head. The result is a very artificial viewing experience which is very detached from the experience of a fan in the bleachers.

SUMMARY OF THE INVENTION

[0002] The present invention aims to solve these and other problems.

[0003] In a preferred embodiment according to the present invention, a method for producing a selectable view of an object space may comprise: a) dividing the object space into a plurality n of object sections to be imaged; b) providing at least n cameras, wherein the cameras are configured such that each object section is associated with at least one unique camera configured to image substantially only that object section; and c) imaging each of the object sections with the unique camera unique to that object section, so as to create at least one image of each object section, wherein the images of the object sections are combined to create a substantially continuous composite mosaic of the object space, wherein a view of a portion of the mosaic is selectably provided to a user based on selection instructions from the user, and wherein at least one of the view, the mosaic, and the images of the object sections is sent to the user via an information network, such as a cable television network. The view may be provided to the viewer via a head-mounted display. Further, the view may be selectably by the user based at least in part on a physical orientation of the head-mounted display.

[0004] In a preferred aspect of the present invention, at least two of the object sections may be imaged at different focal distances. Further, each of the images of the object sections may be sent to the user on a different cable channel.

[0005] In another preferred aspect of the present invention, n may be at least 9. Further, step c) may comprise

imaging each of the object sections with a refresh rate of at least 15 times per second, wherein the view is selectably provided to the user with a refresh rate of at least 15 times per second. Further, the object space may comprise a field for a sporting event.

[0006] In another preferred aspect of the present invention, step b) may comprise providing $2n$ cameras, wherein the cameras are configured such that each object section is associated with two unique cameras, spaced an approximate distance d apart, configured to image substantially only that object section, and step c) may comprise imaging each of the object sections with the two unique cameras, so as to create first and second images of each object section, and the first images of the object sections may be combined to create a first composite mosaic of the object space, and the second images of the object sections may be combined to create a second composite mosaic of the object space, and the first and second images of the object sections or the first and second mosaics may be sent to the user via the information network, and a view of a portion of the first mosaic and a corresponding view of a corresponding portion of the second mosaic may be selectably provided to the user based on selection instructions from the user, so as to provide to the user a three-dimensional representational view of a portion of the object space. The distance d may be equal to or substantially greater than an approximate distance between human eyes.

[0007] In another preferred embodiment of the present invention, a system for providing a selectable view of an object space may comprise: a plurality of cameras configured to image a plurality of object sections of the object space, wherein each object section is associated with at least one unique camera configured to image substantially only that object section; a first image processor connected to the plurality of cameras and configured to combine the images of the object sections into a substantially continuous composite mosaic of the object space; a second image processor connected to the first image processor and configured to extract a selected view of a portion of the mosaic from the mosaic based on selection instructions from a user; a display connected to the second image processor and configured to display the selected view to the user; and an interface connected to the second image processor and configured to provide the selection instructions to the second image processor. The display may be a wireless head-mounted display and the interface may comprise an orientation detector configured to detect a physical orientation of the head-mounted display, wherein the selection instructions are based at least in part on the physical orientation.

[0008] In a preferred aspect of the present invention, the selection instructions may comprise at least two components: a) a position component corresponding to a position of the selected view with respect to the mosaic; and b) a size component corresponding to a size of the selected view with respect to the mosaic, wherein the user may zoom-in in the mosaic by decreasing the size of the selected view and may zoom-out in the mosaic by increasing the size of the selected view.

[0009] In another preferred aspect of the present invention, each object section may be associated with two unique cameras, spaced an approximate distance d apart, configured to image substantially only that object section, so as to create